DOCUMENT RESUME

ED 276 239 EC 191 357

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TITLE Integrating Computer Technology with Severely Handicapped and Learning Handicapped Students.
PUB DATE 86
NOTE 13p.; In: Murphy, Harry J., Ed.; Dunnigan, J. A., Ed. Computer Technology and Persons with Disabilities: Proceedings of the Conference (Northridge, California, October 17-19, 1985); see EC 191 351.
PUB TYPE Reports - Descriptive (141) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Computer Assisted Instruction; *Computer Software; Elementary Secondary Education; *Emotional Disturbances; *Language Arts; *Learning Disabilities; *Severe Disabilities; Teaching Methods; Word Processing

ABSTRACT

The paper describes and evaluates the use of computer instruction with three student populations: severely handicapped, severely emotionally handicapped, and learning handicapped. In the first instance, instruction was aimed at helping severely handicapped students operate software as independently as possible. Important steps in the instructional process are noted, including the use of practice "on line" time and teacher supervision. Teacher inservice time is needed to master the operations. Instruction of learning and emotionally handicapped students used language arts software and focused on teaching students to use the features of the Bank Street word processor. Among benefits noted are increased creativity and improved quality of writing. A list of skills, strategies, and software options to instruct students in basic computer operation concludes the paper. (CL)

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ED276239

Integrating Computer Technology With Severely Handicapped And Learning Handicapped Students

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EC191357

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
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This presentation demonstrates computer application for two populations of handicapped students in Merced County California. The Office of Merced County Superintendent of Schools (OMCSS) operates four coordinated special education programs. Schelby School for the Severely Handicapped, Sierra Schools for the Severely Emotionally Disturbed, Early Childhood Special Education and Education for the Communicatively Handicapped. Each o f these coordinated programs has recently written and received a grant of AB 803 funding from the State Department of Education to improve computer education programs.

Each of these coordinated programs is based on the philosophy described in the OMCSS Computer Usage Plan.

> " Computer Technology represents the most sophisticated set of tools yet developed. In the hands of competent trained teachers, computers can address the full spectrum of learning styles and can bridge communication deficits through the use of speech synthesis and word processing.
>
> As a result of utilizing these sophisticated tools, students will be able to function more independently and effectively in the community.
>
> We believe that appropriate use of computer technologies is a feasible means by which we can develop the full potential of our students."

The purpose of the paper is to describe and review the efficacy of utilizing computer instruction with the severely handicapped students at Schelby School, with the severely emotionally handicapped students at Sierra School and with the county learning handicapped at

Planada School.

Severely Developmentally Delayed Students

The first coordinated program to be discussed in this presentation serves developmentally delayed (with a minimum delay of two years) students at Schelby School who are being taught the rudimentary skills necessary to interact with a computer.

Computer technology is so extremely sophisticated, no person can be an expert in the use of all computers, no matter how gifted or delayed they may be. With this realization in mind, any computer education program must limit the vast number of possible subject areas to the most vital component for productive computer use. The program objective for the developmentally delayed student does just that. It trains the student to operate software as independently as possible.

This objective was selected because most commercially available software requires reading, comprehension and cognitive skills well above the developmentally delayed student's level to operate. Yet, the subject matter of the software is often appropriate for the student's needs. The student is often able to operate these programs with minimal assistance and supervision after some basic instruction with simpler software designed to train specific computer operation techniques, i.e., keyboarding a desired response. Inputting an answer using any key, the space bar or return key, identifying an onscreen prompt to select or operate a program or input an answer. Many errors can be avoided by simplifying (ignoring repetitive prompts) or adapting the input/output phase of the computing process. A list of essential skills including strategy and software used to instruct these

skills accompanies this paper.

The instructional phase of the computer program has demonstrated the need for one on one supervision in the introduction of each software option taught to the individual student. The frustration experienced by the student when seemingly no action taken achieves the desired response is often devastating. The helping hand of an instructor eliminates simple errors which do not pertain to the subject of the lesson, but rather to the operation of the computer.

Teacher inservice time is a vital component for student success. Teachers need time to master the operation of each program they will be instructing. Extra attention needs to be focused on learning and correct response sequence for each on screen prompt and making as many errors as possible to master the correction routines within that program More sophisticated programs have different modes which require different responses such as the write or correct mode, main menu mode and transfer menu mode of the Bank Street Writer word processor. Each mode reacts differently to the same inputs. This type of confusion is eliminated when the teacher spends enough time mastering the software before attempting to have a student use it.

Another important step in the instructional process is the use of practice or experimental "on line" time for each student. It is necessary to observe the student's first independent use of a software option to insure that the reinforcement routine of the software is functionally effective.

Several of the students have found the correction routine of the

software more reinforcing than the reinforcement routine. Teacher attention remains the highest motivator to most students and attention to correct responses and teacher approval in seeing the reinforcement cycle of a software option are usually enough to help the student strive to make correct responses.

Although the first step of the instructional process stresses computer operation rather than correctness of responses, the teacher must begin to shift the instruction back to reinforcement of correctness. Again, the teacher should observe the student's utilization of software options to find the most challenging program which the student will be successful in operating. Some programs lend themselves to this very well by utilizing a "difficulty level counter" which increases the difficulty of problems presented for each correct answer the student inputs. Another important feature of software which will increase the student's ability to operate challenging programs is a good correction routine. Software that simply requests a user to try again contributes to a cycle of frustration. Software which visually demonstrates an algorithm for solving the problem or showing the answer clearly, maintains student interest and often helps to increase skills and competences with the subject matter.

An equally important step in the instructional process is the realization of both staff and student growth. The utilization of time to investigate new software options and develop new programs is the investment which will keep computers interesting and exciting to our teachers and students. Computer usage has a wonderful side effect for the developmentally delayed student since the world at large perceives those who use the computer as smart. This perception is a rewarding

reason to keep our students involved and enthused about trying to use computers.

Severely Emotionally Disturbed and Learning Handicapped Students

The students enrolled in Sierra School represent a student population with a grade level between kindergarden and twelfth grade. The students from the learning handicapped class are third to eighth grades. Students in these programs usually have very significant academic deficits in the area of language arts. The Sierra Students tend to be one to two years behind in their academic achievement in the area of language arts. The learning handicapped students lag three to four years behind their grade level.

Each of the four sites received at least fur Apple Computers to achieve a 3:1 student to computer ratio. The school sites also received at least one printer, one color monitor, a speech synthesizer and a joy stick. The teachers and administrator selected Language Arts software.

Inservice training was provided as an ongoing event. Teachers were provided with a variety of types of inservice. Dr. Dave Uslan, from the California State Department of Education Clearing house Depository for Handicapped Students, was contacted to provide teachers with exposure to new hardware and the variety of things computers can do in the classroom. The school employed an individual with technical expertise to show teachers some of the basic components of the computers system and also to familiarize them with common procedures and commands used in operating software. Further, inservice opportunities are planned as teachers grow more familiar with the machine and how

they will be used in the classes.

Teachers decided which student would learn to touch type and who would hunt and peck depending on the child's coordination and physical size as well as in the typing program.

Our school utilizes the Bank Street word processor; the student is encouraged to use it right away. At first, they used it involving multiple choice and single answers. As they grew more proficient with typing, they were able to complete longer language related assignments. For example, they could complete parts of their spelling assignments such as writing words ten times each or doing sentences for spelling words. Finally, they were able to produce creative writing assignments.

Students were taught to use the features on the Bank Street writer sequentially to permit utilization of the program as rapidly as possible.

1. Enter and edit text
2. Save text on a disk
3. Retrieve text on disk
4. Print text using standard format

The Save and Retrieve functions were very similar procedures. Students were shown how to reach these items on the menu and how to answer correctly the questions asked of them. Actually, many also received prior exposure to these items since they were able to watch the teacher save materials and listen to explanations of how to do it. Students who caught on quickly were also quite wiling to help others.

The teaching staff didn't always have time to guide each student through the procedures.

The majority of students have a desire to use the computer. Of course, some do not have the skills to utilize a program like the Bank Street Writer. There are options for them. Very simple word processors exist. At present, we are exploring the use of programs with our most limited students. Typically, these programs allow the student to type in words on the screen, make corrections and print out the finished product using very few key strokes.

Results

Our program started only a few months ago and we are all still growing. As such, there is little in the way to concentrate data to present at this time except for reports from teacher and students.

Using the word processor, the quality of writing in our classrooms has improved in several ways. Students are producing finished assignments with fewer errors in a shorter time. This is because they can simply edit in text rather than recopying an entire paper. Obviously, the typed papers are neater than handwritten ones. Our students also produce longer assignments.

Finally, the work is more creative. The students seem willing to spend more time putting in colorful adjectives and details to flesh out their stories.

The personal benefit for the students is impressive. Being able to use and control the computers makes them feel successful and intelligent. They feel more confident when they participate in the

writing process. They are even willing to start writing letters for their own purposes and that is point of any good writing program.

Integrating Computer Technology with Severely Handicapped and Learning Handicapped Students

The program objective for the developmentally delayed students is to train them to operate software as independently as possible. The subject matter of many software options is appropriate for these students but operating the computer requires reading, comprehension and cognitive skills far beyond their capabilities.

The instructional process begins with the teacher mastering the operation of each software option they teach. Then, the student is introduced to the program with one-to-one supervision guidance and assistance. The emphasis is on making the software function rather than knowing the correct answer. At this level teachers read all prompts for the student and often input responses for them. Next, the student extends their operation of the machine one step at a time. Students may only touch random keys on the keyboard at first but each step is trained until they are inputting their own answers. The teacher then observes to be sure the programs built in reinforcement cycle is reinforcing to the child and that they are able to answer some of the questions correctly. After being observed, the student refines his skills further by utilizing more commands within the program or learning another program.

The following is a list of important skills, useful strategies and software options used to instruct students in basic computer operation. They are listed in the following format:

Keyboard Interaction: Utilizes brightly colored sound displays that reinforce any touch of the keyboard.

"Colors touch keyboard," "Keyboard star train," PROTRACOA, Stickybear series, XEROX

Muppet Learning Keys (stage one), KOALA, provides an alternative input device for mastering this skill

Keyboard interaction with a single desired key: The space bar and return key are the most commonly used for inputting data.

"Colors teach return key," PROTRACOA, "Body Recognition," LEARNING WELL

Inputting a single key stroke response: Limit the number of possible mistakes by masking unnecessary portions of keyboard. Use software with exciting computer reinforcement for correct responses.

"Match a Letter1," "Match a Number1," PROTRACOA, "Alphabet Song Count," EDUSOFT

Utilizing the escape key to end a program or get help prompt: Teach students to try this technique if the computer repeats a question they don't understand.

All of the previously mentioned, PROTRACOA programs have this feature.

Muppet Learning Key touchtablet has two similar keys, "ZAP" & "HELP."

Waiting for the appropriate prompt before responding: Several programs do not clear the keyboard buffer before each input is read. This leads to extra "return" signals and many wrong answers before a student masters the software operation. Teaching this skill requires one on one over the shoulder attention and shouting "WAIT" a lot. One way to teach this skill is to demonstrate the operating pattern or order for each software option, whether it is input-return-return, or wait for computer to highlight correct answer space bar.

"Keyboard Startrain," PROTRACOA,

"Body Recognition," LEARNING WELL

Utilizing the return key to input an answer: Stress the pattern of input-return, input-return. Do not correct an incorrect input selection. Simply reinforce any appropriate input-return sequences.

"Super Word Printer," PROTRACOA

Inputting responses without holding the key down and repeating characters: Requires mastery of two previous skills inputting single keystroke responses and utilizing the return key to input an answer. If a student is successful in a program requiring only a single keystroke response switching to the same or similar program requiring a multistroke response works well.

"Match a Letter2," "Match a Number2," PROTRACOA

Remembering the s top or escape sequence of a program: This is a problem for many software designs. As each is different they must be taught differently. Have student read or listen to all of the set up questions and prompts in a program, even if the instructor is entering responses which are beyond the students keyboarding, reading or

spelling ability.

"Count Star," "Rocket Star Count," "Doing Match Calculations," PROTRACOA. The last one, "Doing math calculations," has a built in reminder of how to exit the program which quickly becomes tiresome to advanced users and demonstrates the value of memorizing the escape routine.

Selecting a program or subroutine using a menu: Early in the instructional cycle this is often done by the instructor for the student. But when the instructor reads the prompts out loud and encourages the student to input their own responses to the teachers verbal prompt the concept is very easily learned.

"S.C.O.U.T. disk," PROTRACOA, Apple Presents Apple, APPLE II DISKWARE, Body Recognition, LEARNING WELL, MECC Preschool Disk #7.

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